

WHAT IS CLAIMED IS:

1. Method of watermarking a color image that has at least three components,

characterized in that it comprises an insertion step of a mark of watermarking, on at least one point of the image, according to an insertion rule taking into account the relative position of at least three component vectors, for each of said components respectively, associated to said at least one point.

2. Method of watermarking set forth in claim 1, characterized in that for each of said related points, two vectors are selected as reference vectors and one vector to be marked in order to bear said mark of watermarking.

3. Method of watermarking set forth in claim 2, characterized in that said vector to be marked is a central vector, positioned between said reference vectors.

4. Method of watermarking set forth in claim 3, characterized in that the distance between any two vectors of said at least three vectors is calculated, said reference vectors being those the furthest away from each other.

5. Method of watermarking set forth in claim 4, characterized in that a border is set between said

reference vectors, defining two zones respectively associated to binary values "0" and "1".

6. Method of watermarking set forth in claim 5, characterized in that said border is set by the bisector between said reference vectors.

7. Method of watermarking set forth in claim 5, characterized in that the marking of said vector to be marked comprises a possible shift of said vector to be marked in one of said zones, according to the binary value for marking to be applied.

8. Method of watermarking set forth in claim 7, characterized in that said shift has a variable amplitude, according to a marking strength chosen in accordance to at least one local characteristic of said image.

9. Method of watermarking set forth in any claim 5, characterized in that the marking of said vector to be marked comprises a possible shift of said vector to be marked towards one or other of said reference vectors, according to the binary marking value to be applied.

10. Method of watermarking set forth in claim 1, characterized in that it also comprises a transformation step into wavelets of each of said

components of the image, and in that said at least three component vectors are set, for each point of at least one level of decomposition of said transformation into wavelets, for each of said components respectively.

11. Method of watermarking set forth in claim 1, characterized in that at least two marking agreements for a vector are provided.

12. Method of watermarking set forth in claim 11, characterized in that the marking agreement for a given image chosen is the one limiting the risk of conflicts at the time of detecting said mark.

13. Method of watermarking set forth in claim 12, characterized in that one of said marking agreements is chosen according to the number of reference vectors in said image for each of said components.

14. Method of watermarking set forth in claim 6, characterized in that said marking is, at least under normal circumstances, calculated according to:

$$\vec{V}_{M,W}(x,y) = \vec{V}_R(x,y) - (1 - F_M)(\vec{V}_R(x,y) - \vec{V}_M(x,y))$$

where $\vec{V}_M(x,y)$ is said vector to be marked, $\vec{V}_R(x,y)$ is one of said reference vectors, F_M is said marking force and $\vec{V}_{M,W}(x,y)$ is said marked vector.

15. Method of watermarking set forth in claim 14, characterized in that at least two marking agreements for a vector are provided and that, in the event of a conflict, said marking is calculated according to:

$$\vec{V}_{M,W}(x,y) = \vec{V}_R(x,y) - \text{beta} \cdot (1 - F_M) (\vec{V}_R(x,y) - \vec{V}_M(x,y)) ,$$

where $\text{beta} < 1$.

16. Method of watermarking set forth in claim 10, characterized in that it comprises, after said step of associating a mark of watermarking, a transformation step into inverse wavelets, issuing a marked image.

17. Method of watermarking set forth in claim 1, characterized in that said mark is a pseudo-random binary signature written in a redundant manner.

18. Method of watermarking set forth in claim 1, characterized in that said components belong to the group comprising:

- the RGB components;
- the YUV components;
- the CMY components.

19. Device for watermarking a color image that has at least three components,

characterized in that it comprises means of inserting a mark of watermarking, on at least one

point of the image, according to an insertion rule taking into account the relative position of at least three component vectors, for each of said components respectively, associated to said at least one point.

20. Computer program comprising program code instructions saved on a support that can be used in a computer to watermark a color image, having at least three components,

characterized in that said program comprises means of programming that are readable by a computer in order to carry out an insertion step of a mark of watermarking, in at least one point of the image, according to an insertion rule taking into account the relative position of at least three component vectors, for each of said components respectively, associated to said at least one point.

21. Color image having at least three components and comprising a watermarking obtained via inserting a mark of watermarking, in at least one point of the image, according to an insertion rule taking into account the relative position of at least three component vectors, for each of said respective components, associated to said at least one point.

22. Method for detecting a watermarking in a marked watermarking, performed according to claim 1, characterized in that it comprises a recovering step

of a mark of watermarking, in at least one point of the image, according to a recovering rule taking into account the relative position of the at least three component vectors, for each of said components respectively, associated to said at least one point.

23. Method of detection set forth in claim 22, characterized in that said recovering step comprises a sub-step for calculating any two distances between said at least three vectors, and in that the two vectors the furthest away from each other are the reference vectors, the third vector being the marked vector bearing said mark of watermarking.

24. Method of detection set forth in claim 23, characterized in that a border between said reference vectors defining two zones respectively associated to the binary values "0" and "1", said recovering step also comprises a sub-step for identifying the zone in which said marked vector resides, and a step for associating a corresponding binary value.

25. Method of detection set forth in claim 22, characterized in that said mark is recuperated at least twice, and in that a correlation calculation is implemented with regard to a reference signature, in order to decide whether the watermarking is or is not correctly detected.

26. Device for detecting a watermarking in a watermarked image, performed according to claim 1, characterized in that it comprises means of recovering a mark of watermarking, in at least one point of the image, according to a recovering rule taking into account the relative position of at least three component vectors, for each of said components respectively, associated to said at least one point.

27. Computer program comprising program code instructions saved on a support that can be used in a computer to detect a watermarking in a watermarked image, performed according to claim 1,

characterized in that said program comprises means of programming that are readable by a computer in order to carry out a recovering step of a mark of watermarking, in at least one point of the image, according to a recovering rule taking into account the relative position of at least three component vectors, for each of said components respectively, associated to said at least one point.